



SILICONES

WIRE AND CABLE MANUFACTURERS

USING
SILICONE RUBBER INSULATION



GENERAL  ELECTRIC

SILICONE PRODUCTS DEPARTMENT
WATERFORD, NEW YORK

SILICONE RUBBER for WIRE AND CABLE INSULATION

General Electric silicone rubber is the outstanding high temperature flexible insulating material available today. It has excellent electric strength and insulating properties which are maintained at temperature extremes.

Silicone rubber has the best heat resistance of any rubber—natural or synthetic. G-E silicone insulated wire or cable has long service life at temperatures up to 150°C, is useful for many applications at 200°C and can operate for short periods at 300°C. Because of its heat resistance, silicone rubber insulated cable has extra current-carrying capacity. Depending upon operating conditions, this can as much as double the capacity of ordinary cable of the same size.

Silicone rubber is resistant to cold as well as heat and will remain flexible at temperatures down to -60°C (-75°F). Special grades of G-E silicone rubber are available with flexibility as low as -100°C (-150°F).

Resistance to moisture, ozone, chemicals and radiation are important qualities of General Electric silicone rubber insulation. It easily withstands moist operating conditions that cause conventional high-temperature insulations to fail. With ordinary rubber, exposure to ozone and corona result in deep cuts and cracks as well as rapid aging. The useful life of silicone rubber insulation is extended because it virtually is unaffected by ozone, corona, and has good radiation resistance. In addition, it has good oil resistance and will resist splashes of most fuels, solvents and chemicals.

Silicone rubber has good flame resistance; however, it will burn when continuously exposed to a direct flame. Should this happen, General Electric silicone rubber forms a non-conducting ash (silicon dioxide) which continues to insulate during an emergency and does not emit toxic fumes.

There are many other characteristics of General Electric silicone rubber. It has higher thermal conductivity which allows better dissipation of heat from the conductor. Also, when color coding of wires is desirable, silicone rubber colors easily during compounding and is available in a wide variety of shades.

In many applications, such as refrigerator defrosting units, it is essential that insulation not contaminate its surroundings with either taste or odor. G-E silicone rubber, because of its inertness, has neither the odor nor the taste usually associated with ordinary rubber.

CHECK YOUR WIRE AND CABLE INSULATION REQUIREMENTS:

- ✓ **EXCELLENT ELECTRIC STRENGTH**
- ✓ **HEAT RESISTANCE TO 200°C - 300°C**
- ✓ **LOW MOISTURE ABSORPTION**
- ✓ **OZONE RESISTANCE**
- ✓ **EXTRA CURRENT CARRYING CAPACITY**
- ✓ **ODORLESS AND TASTELESS**
- ✓ **LONG LIFE**
- ✓ **LOW TEMPERATURE FLEXIBILITY**
- ✓ **RADIATION RESISTANCE**
- ✓ **EASILY COLORED**
- ✓ **CHEMICAL RESISTANCE**
- ✓ **HIGH THERMAL CONDUCTIVITY**
- ✓ **NON-TOXIC**
- ✓ **FORMS NONCONDUCTING ASH**

**YOU WILL FIND THE RIGHT COM-
BINATIONS OF INSULATION
FEATURES WITH GENERAL
ELECTRIC SILICONE RUBBER**

TYPICAL PROPERTIES OF G-E SILICONE RUBBER FOR WIRE AND CABLE INSULATION

PHYSICAL PROPERTIES

Compound Type	Tensile Strength psi	Elongation %	Abrasion Resistance
General purpose	800-1200	150-450	Fair
Improved Strength	1000-1600	200-850	Good

ELECTRICAL PROPERTIES

Summary of Electrical Properties

Volume Resistivity, ohm-cm	10^{15} - 10^{17}	Dielectric Constant (60 cps)	3.0-3.5
Electric Strength, volts/mil	425-600	Power Factor (60 cps)	0.001-0.010

Effect of Temperature

Temperature, °C	25	150	200	250
Volume Resistivity, ohm-cm	10^{15} - 10^{17}	10^{13} - 10^{14}	10^{12} - 10^{13}	10^{10} - 10^{12}
Electric Strength, volts/mil	425-500	425-500	425-500	425-500

Effect of Frequency

Frequency	60 cps	1 KC	10 KC	1 MC
Dielectric Constant	3.0-3.5	2.9-3.4	2.9-3.3	2.8-3.3
Power Factor*	.001-.01	.001-.01	.001-.01	.001-.01

* Power factor varies with frequency within limits shown.

Effect of Thickness on Electric Strength

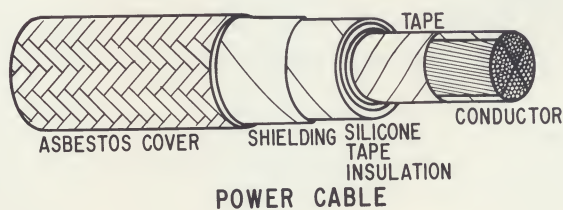
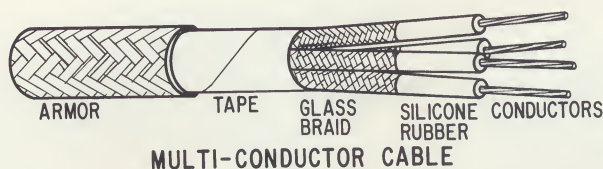
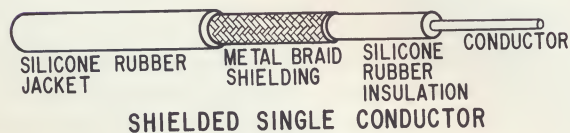
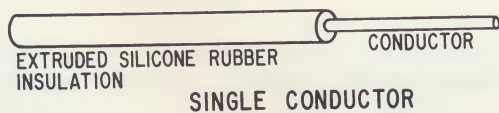
Thickness, mils	25	50	75	125	250
Electric Strength, volts/mil	800	550	450	350	250

Water Immersion

Moisture resistant stocks show no significant change in dielectric constant or power factor after six months' continuous immersion in water at room temperature or at 70°C.

All properties determined at room temperature and 50% RH on standard ASTM slabs 0.075" thick except where otherwise indicated. Properties are typical of commercially available silicone rubber, not guaranteed values.

TYPICAL SILICONE RUBBER WIRE AND CABLE CONSTRUCTIONS



COMPANIES PRODUCING WIRE AND CABLE INSULATED WITH GENERAL ELECTRIC SILICONE RUBBER

The Silicone Products Department of the General Electric Company supplies electrical grade silicone rubber for insulation as a raw material to wire and cable manufacturers.

For assistance in specifying the General Electric silicone rubber most suitable for your application, contact the Silicone Products Department District Office

that is most convenient for you. A listing of District Offices appears on the back of this publication.

For your convenience wire and cable manufacturers using G-E silicone rubber have been listed below according to products manufactured. Beginning on page 6 is an alphabetical listing of these manufacturers with their complete addresses.

CODE 21 Power and Control Cable



(Power station cable, generator leads, power distribution and feeder cable, industrial power and control cable.)

In power stations, G-E silicone rubber insulation provides resistance to heat, ozone, and other aging factors, thereby assuring long life and reliability. These characteristics plus the moisture repellency of silicones allows the extra insulating value needed in industrial power and control cable.

American Steel & Wire Division, U.S. Steel Corporation
American Super-Temperature Wires, Inc.
Boston Insulated Wire & Cable Company
Collyer Insulated Wire Company
Continental Copper & Steel Industries, Hatfield Wire & Cable Division
Continental Wire Corporation
Essex Wire Corporation, Paranite Wire and Cable Division
General Cable Corporation
General Electric Company, Wire & Cable Department
Kaiser Aluminum & Chemical Corporation, Wire Division
Lewis Engineering Company, Wire Division
Okonite Company
Packard Electric Division, General Motors Corporation
Phelps-Dodge Corporation, Habirshaw Wire & Cable Division
Rockbestos Wire & Cable Company, Division of Cerro Corporation
Simplex Wire & Cable Company
Surprenant Manufacturing
Canadian General Electric Company

CODE 22 Appliance, Lighting, Fixture and Hook-up Wire

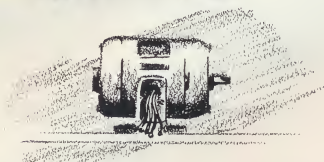


(Wire for industrial lighting circuits as well as pre-wired and built-in fixtures, signs, electrical appliances and similar equipment. Also hook-up wire for electrical and electronic equipment and small specialty wires.)

The resistance of General Electric silicone rubber insulation to moisture, heat, ozone, and corona assures the best insulating performance and reliability for: Today's partially immersible appliances which require moisture resistant insulation; modern lighting circuits that operate in high temperature areas and need "insurance" against frequent failures; many electrical fixtures with "built-in" insulation features which are subject to heat build-up and moisture condensation; hook-up wire that is used to connect electrical equipment in high temperature locations where the risk of fire and equipment shut-down is great.

American Insulated Wire Corp.
American Super-Temperature Wires, Inc.
Belden Manufacturing Company
Boston Insulated Wire & Cable Company
Continental Copper & Steel Industries, Hatfield Wire & Cable Division
Continental Wire Corporation
Eltra Corporation, Prestolite Division
Essex Wire Corporation, Paranite Wire and Cable Division
General Cable Corporation
General Electric Company, Wire & Cable Department
Kaiser Aluminum & Chemical Corporation, Wire Division
Lewis Engineering Company, Wire Division
NRA, Nuclear Research Associates
Okonite Company
Packard Electric Division, General Motors Corporation
Phelps-Dodge Corporation, Habirshaw Wire & Cable Division
Reynolds Metals Company
Rockbestos Wire & Cable Company, Division of Cerro Corporation
Simplex Wire & Cable Company
Springfield Wire & Tinsel Company
Surprenant Manufacturing
Wirekraft, Inc.
Canada Wire & Cable Company
Canadian General Electric Company

CODE 23 Motor and Apparatus Lead Wire



(Lead wire for motors, generators, transformers and other electrical equipment.)

Silicone rubber provides the added resistance to heat, ozone and moisture that almost eliminates the possibility of lead wire failure. With G-E silicone rubber insulated lead wire on some equipment it is possible to bake the equipment with the lead wire in place—a saving in manufacturing cost. Also, silicone rubber is available in a variety of colors for color coding leads.

American Steel & Wire Division, U.S. Steel Corporation
American Super-Temperature Wires, Inc.

Belden Manufacturing Company
Boston Insulated Wire & Cable Company
Collyer Insulated Wire Company
Continental Wire Corporation
Eltra Corporation, Prestolite Division
Essex Wire Corporation, Paranite Wire and Cable Division
General Cable Corporation
General Electric Company, Wire & Cable Department
Kaiser Aluminum & Chemical Corporation, Wire Division
Lewis Engineering Company, Wire Division
Okonite Company
Phelps-Dodge Corporation, Habirshaw Wire & Cable Division
Rockbestos Wire & Cable Company, Division of Cerro Corporation
Simplex Wire & Cable Company
Springfield Wire & Tinsel Company
Surprenant Manufacturing Wirekraft, Inc.
Canada Wire & Cable Company
Canadian General Electric Company
Phillips Electrical Company
Pirelli Cables & Conduit Ltd.

CODE 24 Heating and Defrosting Wire and Cable



(Flexible heating cable for deicing, soil heating, and defrosting of refrigerators, freezers, etc.)

Flexible heating cable insulated with General Electric silicone rubber offers lighter weight, higher temperature rating, greater watts output per foot, less danger of failure due to corrosion,

better flexibility and lower cost. Silicone defroster wire for refrigerators, freezers, and show cases provides the above characteristics plus long service life, resistance to temperature changes, and it is tasteless and odorless.

American Super-Temperature Wires, Inc.
Continental Wire Corporation
Eltra Corporation, Prestolite Division
General Electric Company, Wire & Cable Department
Kaiser Aluminum & Chemical Corporation, Wire Division
NRA, Nuclear Research Associates
Rockbestos Wire & Cable Company, Division of Cerro Corporation
Springfield Wire & Tinsel Company
Surprenant Manufacturing Wirekraft, Inc.
Welcraft Products Co., Inc.

CODE 25 Aircraft and Missile Wire



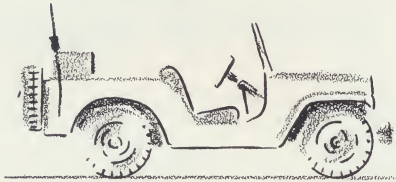
(Insulated wire for miscellaneous aircraft and missile applications, including specification MIL-W-8777.)

Silicone rubber is the best answer to the stringent requirements for aircraft wire insulation. Its excellent heat resistant properties enables silicone insulation to withstand the high temperatures that build up at the outer surface of fast moving aircraft. Silicone rubber has good flame resistance; however, should the silicone rubber burn, it produces a non-conducting ash that continues to insulate during an emergency and does not give off toxic fumes. At extremely low tem-

peratures, silicone rubber remains flexible. Compared with other insulating materials, General Electric silicone rubber is by far the most reliable aircraft wire insulation.

American Super-Temperature Wires, Inc.
Belden Manufacturing Company
Berkshire Technical Products
Boston Insulated Wire & Cable Company
Continental Copper & Steel Industries
Hatfield Wire & Cable Division
Continental Wire Corporation
Eltra Corporation, Prestolite Division
General Cable Corporation
General Electric Company, Wire & Cable Department
Kaiser Aluminum & Chemical Corporation, Wire Division
Lewis Engineering Company, Wire Division
Magnavox Company
NRA, Nuclear Research Associates
Packard Electric Division, General Motors Corporation
Phelps-Dodge Corporation, Habirshaw Wire & Cable Division
Rockbestos Wire & Cable Company, Division of Cerro Corporation
Surprenant Manufacturing Wirekraft, Inc.
Canada Wire & Cable Company
Phillips Electrical Company
Pirelli Cables & Conduit Ltd.

CODE 26 Ignition Wire and Cable



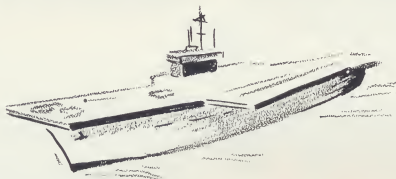
(Wire and cable for aircraft, automotive and marine engine ignition systems.)

Silicone rubber has long been specified as the insulation for high-tension ignition cable for mili-

tary aircraft, ordnance vehicles and marine engines. Because ignition wire in commercial vehicles must now operate at higher temperatures, G-E silicone rubber also is being considered for this application.

American Super-Temperature Wires, Inc.
Continental Copper & Steel Industries, Hatfield Wire & Cable Division
Continental Wire Corporation
Eltra Corporation, Prestolite Division
Lewis Engineering Company, Wire Division
NRA, Nuclear Research Associates
Packard Electric Division, General Motors Corporation
Rockbestos Wire & Cable Company, Division of Cerro Corporation
Wirekraft, Inc.

CODE 27 Shipboard Cable



(Manufacturers of cable meeting specification MIL-C-2194 for Navy application.)

One of the first, and still one of the most important, applications for General Electric silicone rubber is the insulation of Navy cable. The U.S. Navy has found that silicone rubber, with its higher current-carrying capacity, has made possible significant savings in weight and space. In

addition, silicone rubber burns to a non-conducting ash under disaster conditions and allows a high degree of power continuity.

American Steel & Wire Division, U.S. Steel Corporation
Collyer Insulated Wire Company
Continental Copper & Steel Industries, Hatfield Wire & Cable Division
Continental Wire Corporation
General Cable Corporation
General Electric Company, Wire & Cable Department
Okonite Company
Phelps-Dodge Corporation, Habirshaw Wire & Cable Division
Rockbestos Wire & Cable Company, Division of Cerro Corporation
Surprenant Manufacturing
Canada Wire & Cable Company
Pirelli Cables & Conduit Ltd.

ALPHABETICAL LISTING OF WIRE AND CABLE MANUFACTURERS

<u>Company Name and Address</u>	<u>Types of Wire and Cable Made with Silicone Rubber</u>	<u>Company Name and Address</u>	<u>Types of Wire and Cable Made with Silicone Rubber</u>
American Insulated Wire Corp. 36 Freeman Street Pawtucket, Rhode Island	Code 22	Boston Insulated Wire & Cable Co. 65 Bay Street Dorchester 25, Massachusetts	Code 21, 22, 23, 25
American Steel & Wire Division U.S. Steel Corporation Worcester 7, Massachusetts	Code 21, 23, 27	Collyer Insulated Wire Company 100 Higginson Street Lincoln, Rhode Island	Code 21, 23, 27
American Super-Temperature Wires, Inc. 112 West Canal Street Winooski, Vermont	Code 21, 22, 23, 24, 25, 26	Continental Copper & Steel Industries Hatfield Wire & Cable Division 487 Hillside Avenue Hillside, New Jersey	Code 21, 22, 25, 26, 27
Belden Manufacturing Company 4647 West Van Buren Street Chicago, Illinois	Code 22, 23, 25	Continental Wire Corporation 322 North Cherry Street Wallingford 2, Connecticut	Code 21, 22, 23, 24, 25, 26, 27
Berkshire Technical Products Box 2071 Reading, Pennsylvania	Code 25	Eltra Corporation Prestolite Division Port Huron, Michigan	Code 22, 23, 24, 25, 26

<u>Company Name and Address</u>	<u>Types of Wire and Cable Made with Silicone Rubber</u>	<u>Company Name and Address</u>	<u>Types of Wire and Cable Made with Silicone Rubber</u>
Essex Wire Corporation Paranite Wire and Cable Division Marion, Indiana	Code 21, 22, 23	Packard Electric Division General Motors Corporation Dana Avenue Warren, Ohio	Code 21, 22, 25, 26
General Cable Corporation 730 Third Avenue New York, New York	Code 21, 22, 23, 25, 27	Phelps-Dodge Corporation Habirshaw Wire & Cable Division 300 Park Avenue New York, New York	Code 21, 22, 23, 25, 27
General Electric Company Wire & Cable Department 1285 Boston Avenue Bridgeport 2, Connecticut	Code 21, 22, 23, 24, 25, 27	Reynolds Metals Company Front Street Chester, Pennsylvania	Code 22
Kaiser Aluminum & Chemical Corporation Wire Division Wood Street Bristol, Rhode Island	Code 21, 22, 23, 24, 25	Rockbestos Wire & Cable Company Division of Cerro Corporation 285 Nicoll Street New Haven 4, Connecticut	Code 21, 22, 23, 24, 25, 26, 27
Lewis Engineering Company Wire Division Naugatuck, Connecticut	Code 21, 22, 23, 25, 26	Simplex Wire & Cable Company 79 Sidney Street Cambridge 39, Massachusetts	Code 21, 22, 23
Magnavox Company South Bueter Street Ft. Wayne, Indiana	Code 25	Springfield Wire & Tinsel Company 70 Leete Street Springfield, Massachusetts	Code 22, 23, 24
NRA, Nuclear Research Associates 35-01 Queens Boulevard Long Island City, New York	Code 22, 24, 25, 26	Surprenant Manufacturing 122 Sterling Street Clinton, Massachusetts	Code 21, 22, 23, 24, 25, 27
Okonite Company 1940 Canal Street Passaic, New Jersey	Code 21, 22, 23, 27	Wirecraft, Inc. Rolling Prairie, Indiana	Code 22, 23, 24, 25, 26
		Welcraft Products Co., Inc. Lakeville, Indiana	Code 24

IN CANADA

Canada Wire & Cable Company Leaside Toronto 17, Ontario	Code 22, 23, 25, 27	Phillips Electrical Company King Street West Brockville, Ontario	Code 23, 25
Canadian General Electric Company Park Street Peterborough, Ontario	Code 21, 22, 23	Pirelli Cables & Conduit Ltd. St. Jean, Quebec	Code 23, 25, 27

CODE CLASSIFICATION

21 Power and Control Cable	24 Heating and Defrosting Wire and Cable
22 Appliance, Lighting, Fixture and Hook-up Wire	25 Aircraft and Missile Wire
23 Motor and Apparatus Lead Wire	26 Ignition Wire and Cable
	27 Shipboard Cable

Progress Is Our Most Important Product

GENERAL ELECTRIC

SILICONE PRODUCTS DEPARTMENT
WATERFORD, NEW YORK

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GENERAL  ELECTRIC

WATERFORD, NEW YORK

SALES OFFICES

CALIFORNIA

CONNECTICUT

D. C.

FLORIDA

ILLINOIS

MASSACHUSETTS

MICHIGAN

MISSOURI

NEW JERSEY

NEW YORK

NORTH CAROLINA

OHIO

PENNSYLVANIA

TEXAS

WISCONSIN

IN CANADA

FOR EXPORT

Downey, 8555 East Florence Ave.—SPruce 3-3144
Burlingame, 1229 Burlingame Ave.—DIamond 4-5757
Bridgeport 2, 1285 Boston Avenue—EDison 4-1012
Washington—OLiver 2-3124
Jacksonville 3, P.O. Box 2614—EXbrook 8-1822
Chicago 80, 840 South Canal St.—WABash 2-5611
Boston 35, 145 North Beacon Street—ALgonquin 4-5318 & 4-5319
Detroit 1, 2211 Woodward Avenue—WOodward 3-7811
St. Louis 10, 2375 Hampton Ave.—STERling 1-0409
Newark, 254 Elizabeth Avenue—BIgelow 3-3662
Waterford—ADams 8-3330 Ext. 203, 213
Schenectady—FRanklin 4-2211 Ext. 5-4645
New York, 570 Lexington Ave.—PLaza 1-1311, Ext. 2583
Greensboro, 1801 Pembroke Road—BRoadway 3-0051
Cleveland 9, 1503 Brookpark Road—SHadyside 9-2700
Drexel Hill, 5050 State Road—CLearbrook 9-2131
Dallas, 6500 Cedar Springs—Fleetwood 1-3725
Houston 27, 4219 Richmond Ave.—MOhawk 7-7595
Milwaukee 1, 540 South 1st Street—BRoadway 6-7730
Canadian General Electric Company Ltd.
940 Lansdowne Avenue, West Toronto—LEnnox 4-6511
International General Electric Company
New York 17, 150 East 42nd Street—PLaza 1-1311